

[0041] A method for suspending data transmission, applied for supporting continuous transmission of a group service includes:

[0042] receiving, by an eNB, a message, the message comprising a suspend indication and a service identifier; the suspend indication and the service identifier being used to indicate that data transmission of a service corresponding to the service identifier is to be suspended;

[0043] sending, by the eNB, the message comprising the suspend indication and the service identifier; initiating, by a UE needing to continuously receiving service data corresponding to the service identifier, a procedure of establishing a point-to-point carrier;

[0044] stopping, by the eNB, sending the data service at a preset time point.

[0045] Preferably, the message further comprises time information indicating a modification period, a SFN or a time point from which the data transmission is suspended.

Advantageous Effects of Invention

[0046] As can be seen from the above technical solutions, in the technical solutions for supporting group service transmission and obtaining a UE counting result provided by the present invention, the MCE notifies the eNB to obtain the UE counting result of the UEs in the idle mode, or the UEs in the idle mode sends the UE counting response, or when suspending the data transmission, the MCE notifies the eNB and the UE and the data are transmitted for a certain time period, during this time period, the point-to-point carrier may be established by the UE. According to the technical solutions of the present invention, when the UE needs to receive the eMBMS, the MCE may obtain the correct counting result and not make wrong decision no matter whether the UE is in the RRC connected mode or in the idle mode. Therefore, the UE does not need to establish the point-to-point channel, and the interruption of the data transmission and unnecessary power consumption are avoided.

BRIEF DESCRIPTION OF DRAWINGS

[0047] FIG. 1 is a schematic diagram illustrating a conventional LTE system.

[0048] FIG. 2 is a schematic diagram illustrating a conventional eMBMS.

[0049] FIG. 3 is a flowchart illustrating signaling for obtaining a UE counting result according to a first embodiment of the present invention.

[0050] FIG. 4 is a flowchart illustrating a method for obtaining a UE counting result according to a second embodiment of the present invention.

[0051] FIG. 5 is a flowchart illustrating a method for obtaining a UE counting result according to a third embodiment of the present invention.

[0052] FIG. 6 is a flowchart illustrating a method for suspending data transmission according to a fourth embodiment of the present invention.

[0053] FIG. 7 is a schematic diagram illustrating an UE according to a fifth embodiment of the present invention.

MODE FOR THE INVENTION

[0054] In order to make the object, technical solution and merits of the present invention clearer, the present invention

will be illustrated in detail hereinafter with reference to the accompanying drawings and specific examples.

[0055] The main idea of the present invention is as follows. When needing to obtain a UE counting result, a MCE decides whether to count the number of UEs in the idle mode according to the service type of a carried MBMS. If it is needed to count the number of UEs in the idle mode, the MCE obtains the UE counting result of both the UEs in the RRC connected mode and in the idle mode. Or, when it is decided to suspend the data transmission, the MCE notifies an eNB to delay the action of suspending the data transmission for a certain time period. During this time period, if the UE in the idle mode still needs to receive data transmitted via the original MBMS carrier, a point-to-point carrier may be established. After the point-to-point carrier is established, the eNB suspends transmission of the MBMS data and control information. According to the technical solutions of the present invention, data loss caused by changing of the data carriers is decreased, time delay for establishing the data carrier is reduced, the air interface resources is utilized effectively and power consuming of the UE is saved.

[0056] A first embodiment is provided.

[0057] In the first embodiment, a signaling flow for obtaining a UE counting result is described.

[0058] FIG. 3 is a flowchart illustrating signaling for obtaining a UE counting result according to a first embodiment of the present invention. As shown in FIG. 3, the signaling flow includes the following processing.

[0059] At 301, a MCE sends a UE counting request message to an eNB to notify the eNB to count the number of the UEs in a MBSFN scope. The message includes a MBSFN area identifier and a MBMS service identifier TMGI, and the message also includes indication information to indicate that the eNB needs to count the number of UEs in an idle mode.

[0060] When receiving MBMS data, the UE may be in a RRC connection mode or in the idle mode. The conventional method for UE counting may be used for the UEs in the RRC connected mode, but cannot be used for the UEs in the idle mode.

[0061] The MCE needs to determine whether need to count the UEs in idle mode. The MCE can determine it based on information carrying in an MBMS Session Start sent by an MME. For example, the MME sends the MBMS Session Start including the MBMS service identifier TMGI, and the message also indicates that an service carried by the MBMS carrier is a GCSE service.

[0062] Alternatively, according to operation maintenance preconfiguration, the MCE knows a certain MBMS service or some MBMS services are the GCSE service. For example, the MBMS service identifier TMGI corresponding to a group of CSG services may be configured in advance, and the MCE may obtain the above information accordingly.

[0063] After determining the service needing to count the idle mode UEs, the MCE sends a counting request message including the indication information for the MBMS service needing to count the idle mode UEs.

[0064] At 302, the eNB sends a counting request message to the UE. The message is sent via a MBMS control channel of an air interface, and includes information indicating the MBMS service identifier. The UE may determine a MBMS service needing to obtain the number of the UEs according to the information included in the message. The message may also include indication information to indicate the UEs